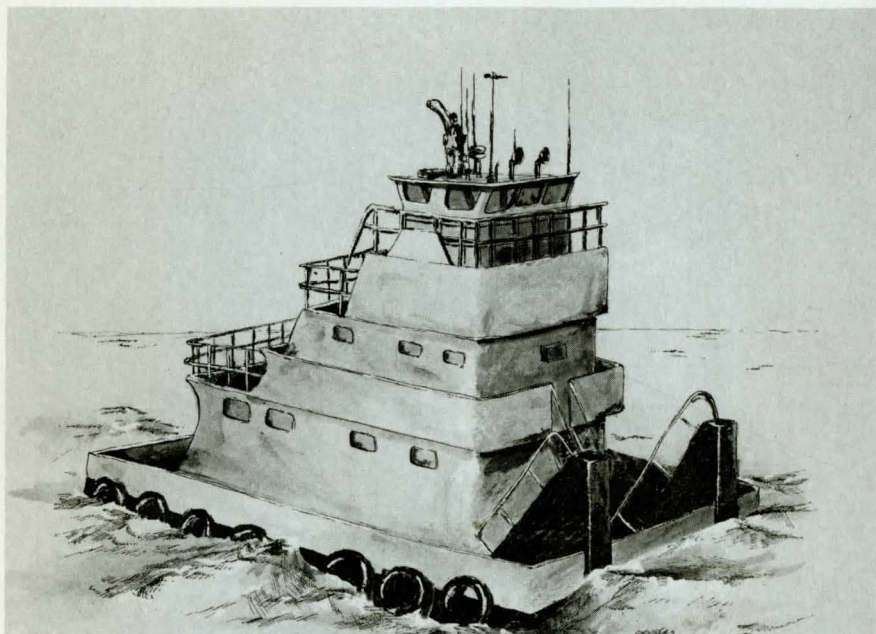


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IOWA DOT ~~STATE~~ WATERWAY USER CHARGE PROPOSAL



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RIVER TRANSPORTATION DIVISION
SEPTEMBER 22, 1976



J M^c Coy

On May 3, 1977, the Iowa
Department of Transportation
Commission voted to make the
attached Staff Waterway User
Charge Proposal an Iowa
Department of Transportation
Waterway User Charge Proposal.

ABSTRACT

Waterway User Charges

The Iowa DOT reviewed Corps of Engineers accounting records to determine the costs of operating and maintaining a 300 mile section of the Mississippi River. An analysis of accounts was made, and costs were separated into channel and lock maintenance components.

The Iowa DOT examined the impact of assessing 43% of the attributable charges against the barge companies, ...an amount comparable to that paid by the trucking industry for the publicly-owned highway system. The results were:

3¢ per gallon of fuel
\$32 per single lockage

The above waterway user charges would cause a 3% to 4% increase in barge rates (e.g., Davenport to New Orleans from \$5.32/ton to \$5.47/ton, or + 1/2¢/bushel). Such rates do not appear sensitive to variations in the 43% cost-coverage assumption, since a $\pm 10\%$ change = $\pm 1\%$ rate change.

The proposed charges would generate \$75 to \$100 million annually across the nation. User charges were not recommended for recreational boaters.

The Iowa DOT urges further study to determine whether the 300 mile section studied is nationally representative in its maintenance costs, standards, and the analytical methodology used.

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Why User Charges?

In 1787 the Northwest Ordinance first addressed the topic of waterways by saying that navigable waterways shall be "forever free.... without any tax, impost, or duty...." At the time, there were few navigation alternatives in a developing frontier country. In the 1830's, the Federal Government began funding further navigational improvements on the Mississippi River. The first such works consisted of the removal of snags, shoals, and sand bars; and the dynamiting and excavation of rock to clear passage. In 1878, Congress authorized the first comprehensive project on the upper Mississippi River---a 4 1/2-foot channel to facilitate commerce. In that project, several rapids were completely by-passed by construction of short parallel canals with navigation locks. Later, in 1907, a 6-foot channel was authorized. The increased depth was obtained primarily by construction of hundreds of rock and brush "wing dams"---low structures extending from the shore out into the river to constrict water flows.

In 1930, after extensive study, Congress authorized the present 9-foot channel project on the upper Mississippi River north from the Missouri River confluence to Minneapolis. The navigation depth was to be achieved by construction of a system of locks, dams, and dredging.

The Federal Government's concern with creating a viable water transportation system is further illustrated by the fact that beginning in 1918 a federally owned barge line was established on the Mississippi River and her tributaries. This was intended to stimulate investment by the private sector, and usage of the forthcoming river improvements. It was the major operator for years, as competition gradually began to appear. In 1953, the **Federal Barge Lines** was sold by the Government to a private corporation, having met its congressionally mandated objectives.

Waterway users today still enjoy use of the government built and maintained river systems without "....any tax, impost, or duty...." All navigable rivers and canals of the United States share this background of federal subsidization. In other parts of the world fees are assessed for waterway usage. Users of the St. Lawrence Seaway, for example, pay a seaway fee. Users of the

Welland Canal between lakes Erie and Ontario pay \$800 to transit the canal's 8 locks.

Trucks pay fuel taxes, permit fees, and tolls to operate on our nation's highways. Aircraft pay fuel and ticket taxes plus landing fees for the use of our nation's airports and air control systems. Additionally, while not routinely subsidized by the Federal Government, railroads nonetheless pay substantial property taxes. Therefore, after careful consideration, the Iowa DOT staff endorses the concept of waterway user charges. Whether or not the State of Iowa ultimately supports such user charges will depend upon the content of this report and the comments generated by the public review process. These comments will be reviewed carefully by the Transportation Commission prior to finalizing a departmental position.

Purpose Of The Study

The question now becomes one of how much, and how to assess it. User charges may be assessed by various methods. Those most often mentioned, and considered most realistic are:

1. A fuel tax.
2. A locking fee.
3. A ton-mile assessment.
4. Combinations of the above.

Analysis of the above methods reveals that the ton-mile assessment is the most difficult to administer, and the least familiar to other fee-paying transportation modes. Consideration of the remaining alternatives suggests that a combination fuel tax and locking fee would be the easiest to administer, and could be equitably assessed and audited.

Thus, the balance of this paper discusses whether or not a realistic user charge system can be developed on the basis of a combination fuel tax and locking fee.

The Study

Since an analysis of the entire United States waterway system is a lengthy and expensive task, and beyond Iowa's capabilities, it was decided to analyze representative areas. If

accurately performed, the results could then be extrapolated nationwide.

For this study we analyzed data for the 300 mile, 12 lock-and-dam Army Corps of Engineers Rock Island District, (Guttenberg, Iowa to Hannibal, Mo.). The fuel tax and the locking fee are designed to recover the District's operation and maintenance costs attributed to commercial navigation for the channels and all 12 locks. As to its "typicality", the Iowa DOT staff feels that since the District maintains channels and locks to nationwide Corps standards that it is unlikely to be atypical.

If the results of this study indicate this approach to be realistic, it is the intention of the Iowa DOT to propose that the Federal Government explore the possibility of using a similar methodology on a national scale. The Iowa DOT would be pleased to participate in the design and management of such a study, not unlike the role recently assumed in the (federally funded) state rail study.

Rationale

The rationale for user charges based on fuel tax and lockage is founded upon three concepts:

1. User fees should be based only on the costs attributable to the user for commercial navigation. Recreational costs, flood control costs, and costs associated with power generation should not be included. Further, the computation of these costs should be based on specific accounting data, not estimates of what "should be."
2. Users should not pay for replacement and maintenance of obsolete locking facilities, or their major components. The cost of replacements causing a significant increase in locking capacity (say, ---greater than 10%.) should be born in part by commercial users.
3. Commercial system costs paid by river users could, for example, be made proportional to what other modes pay for their systems. The trucking mode of transportation is a good bellwether since:

Trucks account for almost 80% of the nation's freight bill and about 20% of all freight ton miles.

Detailed cost data and history is available.

Highways are government owned and user charges (taxes) are set by the Government.

Recreational User Charges?

Several comments have been received concerning the staff's position that no assessment of recreational boats is proposed. The major reasons are:

1. Recreational boaters had use of the river before the lock and dam system was built. In some ways the dams are obstacles to their formerly unimpeded movement on the river.
2. Channel dredging is not necessary for shallow draft recreational users of the river, most of which have a maximum draft of 3 feet or less.
3. In Iowa recreational boaters pay an annual \$4 licensing fee. Most other states along the river also require some form of state licensing for recreational boaters.
4. Recreational boaters currently pay a 7c per gallon State tax and a 4c per gallon Federal gasoline tax.

The Calculations

The calculations follow the steps:

First, determine total actual monies spent by the Corps on navigation related activities.

Second, divide these costs into two categories

- lock maintenance
- channel maintenance

Third, remove the recreational cost component.

Fourth, add commercial navigation costs from non-Corps accounts, e.g., Coast Guard.

Fifth, multiply the total by the same proportionality factor now paid by the trucking industry.

Sixth, test the sensitivity of the conclusion, to a change in the proportions used in step 5 above.

TABLE 1
OVERALL ANNUAL COSTS
(ROCK ISLAND DISTRICT)

	ANNUAL COST -----	\$8.43 MILLION
<u>LESS</u>	NON-NAVIGATION RELATED -----	<u>1.80 MILLION</u>
	COST ₁ -----	6.63 MILLION
<u>LESS</u>	MAJOR COMPONENT REPLACEMENT -----	<u>.10 MILLION</u>
	COST ₂ -----	\$6.53 MILLION

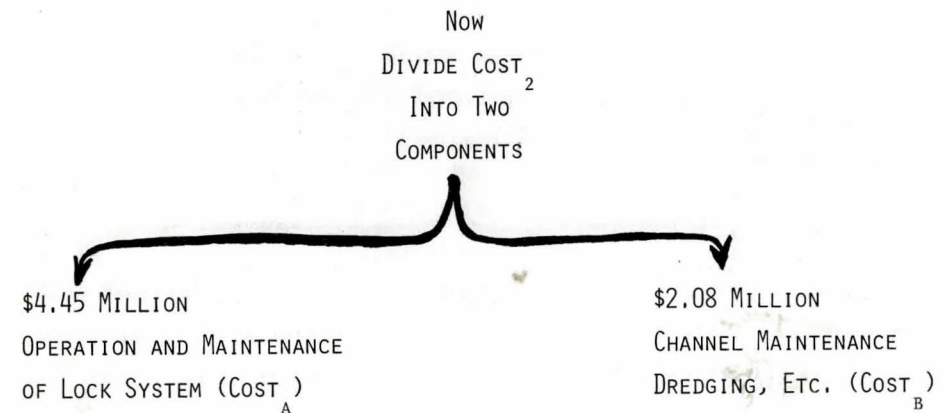


TABLE 2
OPERATION AND MAINTENANCE (O & M)
OF LOCK SYSTEMS
(LOCKING FEE COMPUTATIONS)

	COST _A -----	\$4.45 MILLION (FROM TABLE 1)
LESS	RECREATIONAL NAVIGATION COSTS*-----	<u>1.47 MILLION</u>
	COST _{A1} -----	\$2.98 MILLION

THUS \$2.98 MILLION (COST_{A2}) EQUALS THE TOTAL COMMERCIAL NAVIGATION COSTS ATTRIBUTABLE TO O & M OF THE LOCK AND DAM SYSTEM. HOWEVER, SINCE THE TRUCKING INDUSTRY PAYS 43% OF THE COSTS OF THE HIGHWAY SYSTEM, WE WILL ADJUST THE BARGE INDUSTRY REMUNERATION BY THAT SAME PERCENTAGE.

$$.43 \times \$2.98 \text{ MILLION} = \$1.28 \text{ (COST}_{\text{FINAL}})$$

FINALLY, WE DIVIDE OUR FINAL LOCK O & M COST BY THE TOTAL NUMBER OF COMMERCIAL LOCKAGES TO ARRIVE AT A LOCKING FEE.

$$\frac{\$1.28 \text{ MILLION}}{40,000 \text{ COMMERCIAL LOCKAGES}} = \frac{\$32.00}{\text{SINGLE LOCKAGE}}$$

*RECREATIONAL NAVIGATION COSTS ARE SEPARATED BY INDIVIDUAL ACCOUNTS, AND ARE APPROXIMATELY 33% OF TOTAL LOCK O & M COST.

TABLE 3
CHANNEL MAINTENANCE COSTS
(FUEL TAX COMPUTATION)

COST _B --- \$2.08 MILLION (FROM TABLE 1)	
<div style="display: flex; justify-content: space-around;"> COMMERCIAL NAVIGATION COMMERCIAL & RECREATIONAL NAVIGATION </div>	
COST _{B1} --- \$ 820,000 (1)	COST _{B2} --- \$1,260,000 (2)
COST _{B3} --- 844,000	LESS ----- 416,000 (3)
COST _{B4} --- 1,664,000	COST _{B3} --- \$ 844,000
PLUS ----- 96,000	
COST _{B5} --- \$1,760,000	

(COAST GUARD
ACCOUNTS)

THUS \$1.76 MILLION IS THE COMMERCIAL NAVIGATION COSTS ATTRIBUTABLE TO CHANNEL MAINTENANCE. USING THE SAME FACTOR OF 43% AS EXPLAINED IN TABLE 2 WE GET:

$$.43 \times \$1.76 \text{ MILLION} = \$756,800 \text{ (COST}_{\text{FINAL}})$$

WE KNOW THAT 26.5 MILLION GALLONS OF FUEL WERE CONSUMED IN THE ROCK ISLAND DISTRICT. THEREFORE IF WE DIVIDE OUR FINAL COST BY 26.5 MILLION, WE WILL GET THE COST PER GALLON REQUIRED TO PAY FOR CHANNEL MAINTENANCE.

$$\frac{\$756,800}{26.5 \text{ MILLION GALLONS}} = \$0.028 \text{ OR APPROXIMATELY } \underline{3 \text{ CENTS}} \text{ PER GALLON FUEL TAX.}$$

- (1) COSTS 100% ATTRIBUTABLE TO NAVIGATION.
 (2) COSTS ATTRIBUTABLE TO BOTH COMMERCIAL AND RECREATIONAL NAVIGATION
 (3) COST_{B2} REDUCED BY 33% FOR RECREATION AS EXPLAINED IN TABLE 2.

The results of the analysis indicate a charge of:

3¢ per gallon
\$32 per lockage

would place commercial barge companies in a user charge position similar to that experienced by trucks. This is not meant to endorse the fact that trucks cover 43% of the costs of the system that they use. That is not the issue, and legislation may change that proportion. The increased costs of road construction and maintenance (caused by the Middle East oil price escalation) caused the current 43% figure --- it was substantially higher before the oil prices jumped.

One way to determine the viability of a 43% figure would be to examine the sensitivity of the conclusions in the range of 33% user charge coverage to 53% user charge coverage:

	Coverage %		
	33%	43%	53%
Fuel tax (per gallon)	2.2¢	3¢	3.5¢
Lockage fee (per lockage)	\$25	\$32	\$40

The next task is to measure the impact of such fees on the rate structure.

Impact On Commercial Users

An obvious concern is how such a fee system will affect shipping rates. For example, rates to and from Iowa. The following is an analysis of the estimated user charge impact on rates charged by a typical upper Mississippi River towing company if the trucks-cover-43%-of-highway-cost figure is used:

RATE CHANGE W/WATERWAY USER CHARGE

	Current Barge Rate (100% Tariff)	Barge Rate With User Charge @ 43% Coverage	Increase \$	Increase %	Current Rail Rate
GRAIN	\$5.32/Ton	\$5.47/Ton	0.4¢/Bu.	3%	\$13.20/Ton
Davenport to New Orleans (1350 River Miles)					
COAL	\$2.80/Ton	\$2.90/Ton	10¢/Ton	3.5%	\$ 9.00/Ton
St. Louis to Guttenberg, Ia. (425 River Miles)					
FERTILIZER	\$3.60/Ton	\$3.71/Ton	11¢/Ton	3%	\$12.00/Ton
New Orleans to Ft. Madison, Ia. (1250 River Miles)					

The previous sensitivity analysis indicates that if the coverage ratio were to drop to 33% that the grain rate would be \$5.43/ton. At 53% coverage, the grain rate would be \$5.52/ton. Thus, for a 20 percentage point swing in the coverage ratio, grain rates would only swing 2%, or 9¢/ton. Thus the pricing structure and competitive relationships of the industry are not likely to be destroyed even if new coverage ratios are established in the future.

The anticipated annual new taxes paid by a "typical"* barge company under the Iowa user charge proposal are:

Fuel Taxes	\$189,000
Locking Fees	246,000
Total	\$435,000 1 yr.
After Taxes	\$217,500

*"Typical" means 5-10 towboats, 200-300 barges, plying the Mississippi and doing about \$10-15 million annual revenue.

Such increases in costs to the barge company would have to be passed on to the consumers, in this case, the commercial buyers and sellers of bulk commodities. Instantaneous recovery appears possible for the unregulated carriers and regulated carriers of exempt commodities. The "spread" of over or under tariff can be adjusted for the next day's telephone quotations on water transport costs. For the regulated carrier and commodity, the process is one of receiving ICC approval....a slower and more uncertain course.

The foregoing represents how the Iowa DOT would recommend that user charges be assessed against river operators. The interesting aspect of this study is that user charges are based on the repayment of a portion of the actual costs of the river system as extracted from Corps accounting data. User fees should be as stable as other existing user charges, only changing to meet an emergency (e.g., hijacking) or financial needs to maintain the system (e.g., every 5-10 years). The proposed waterway user charge parallels current repayment methods used by other federally subsidized modes:

Government Assisted Mode	Tolls	Fuel Tax
Aviation	- Yes (Landing Fees)	Yes
Trucking	- Yes (Toll Roads)	Yes
Waterway	- Yes (Locking Fees)	Yes

Such a listing does not mean to ignore railroads, and the recent \$6 billion rail assistance bill---but the rails are not a traditional tax user. Oil pipelines, while generating almost 25% of intercity ton mileage, are not major fuel consumers or subsidy receivers.

• Next Steps

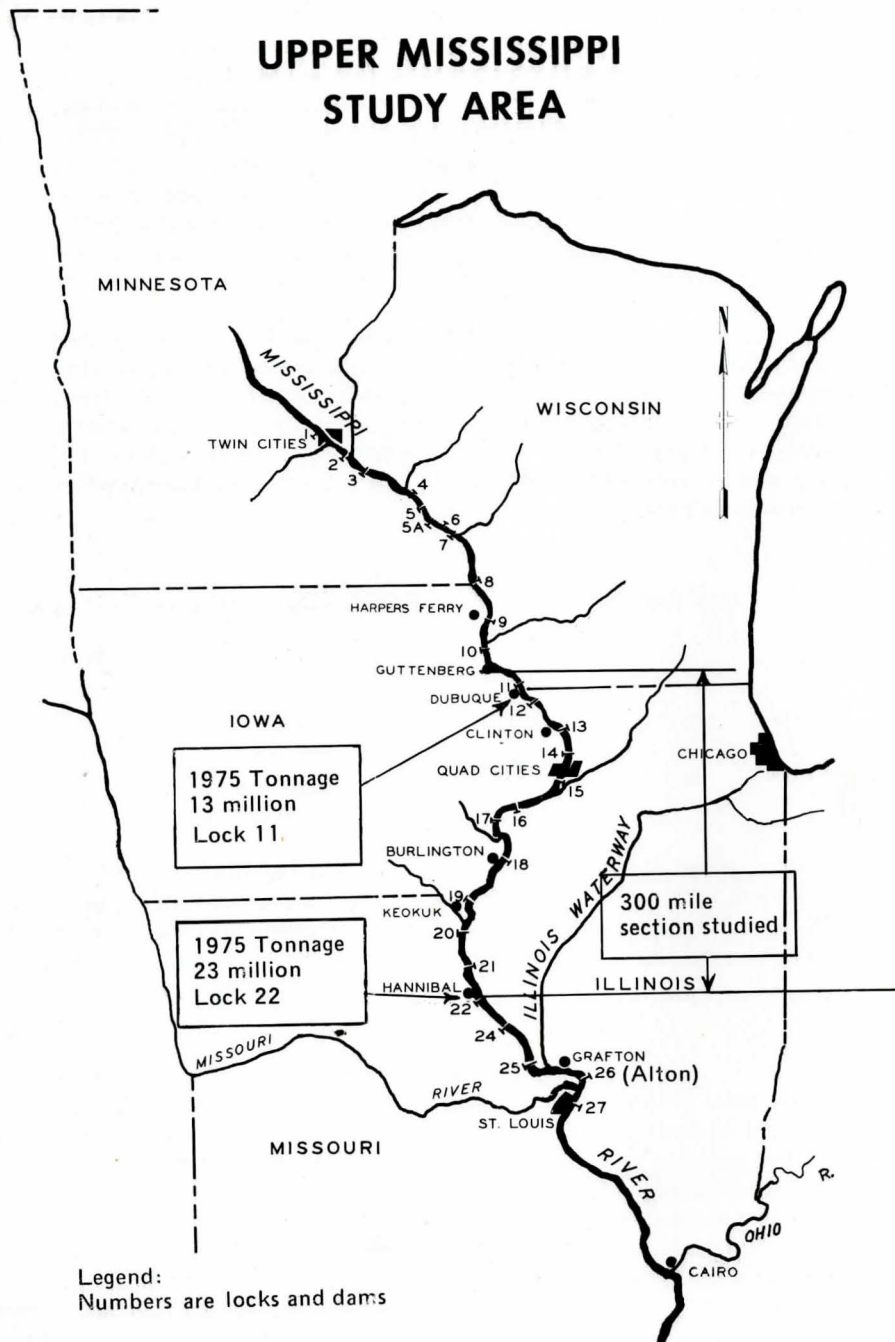
We have illustrated that a system of imposing user charges based on a fuel tax and locking fee, computed from actual Corps cost data, is realistic. Such a system is in keeping with the concept of a national transportation fund funded by user charges. Collections by the Federal Government from waterway operators could be placed in a dedicated transportation trust fund. Whether or not such a waterway charge should be

imposed all at once (now or at some future date) or gradually imposed over 3 to 5 years, is a subject for further study and a decision by the Congress and the executive branch.

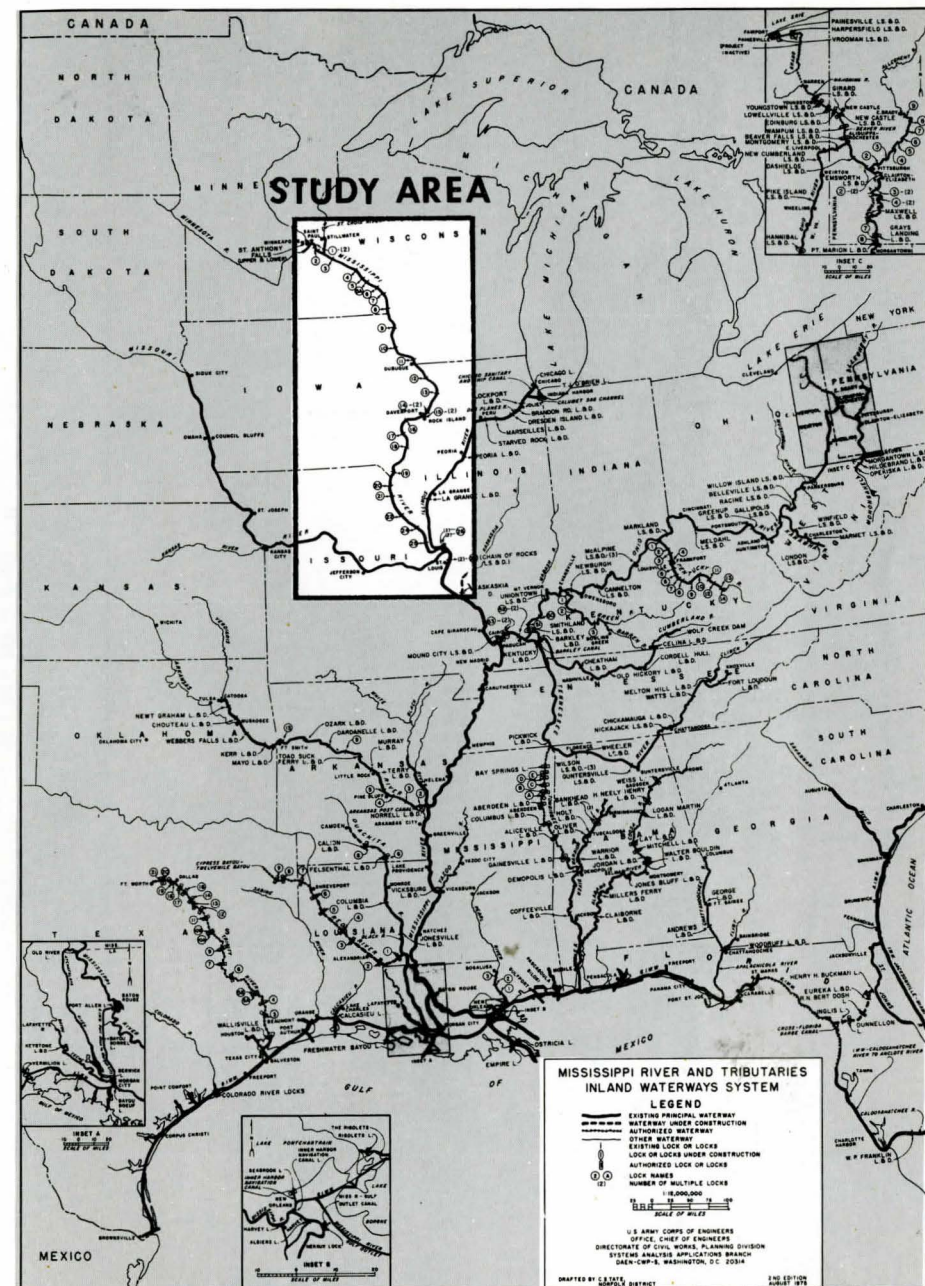
The Iowa proposal has three strong points: It is simple, it appears to be equitable, and it has precedent. It is therefore recommended that the Iowa DOT Commission, prior to making a final decision, hold formal public hearings in the near future to sample public opinion concerning such a system, and to further assess economic and social impacts. Included in such public hearings would be a concerted effort to review the staff's conclusions with the appropriate congressional personnel, federal officials, shippers, producers and water carriers.

It is further recommended that the Iowa DOT staff request the Federal Government to give consideration to the further study of this proposal. The Iowa DOT (with the necessary federal funding assistance) would conduct a nationwide feasibility study of such a system using all Corps Districts (and their actual cost data) and at the same time would investigate other modal proportionate shares.

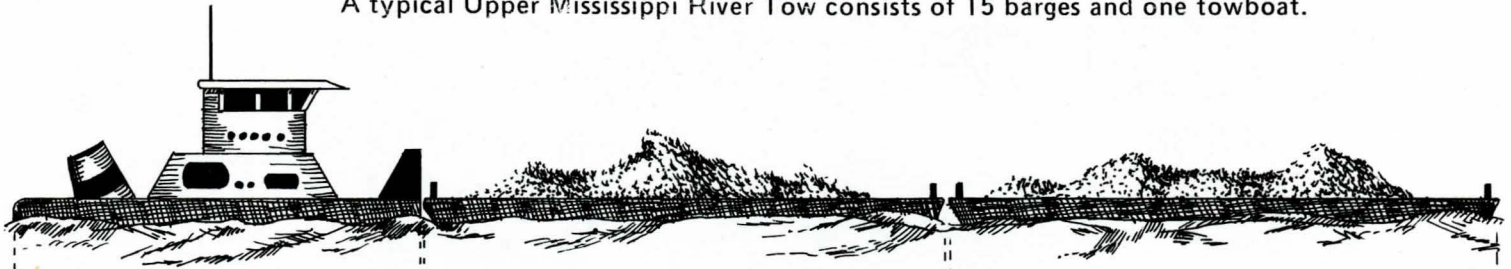
UPPER MISSISSIPPI STUDY AREA



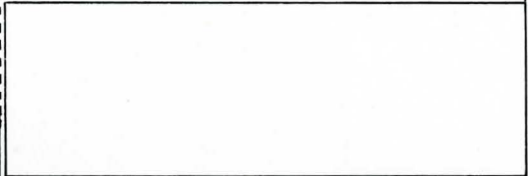
Legend:
Numbers are locks and dams



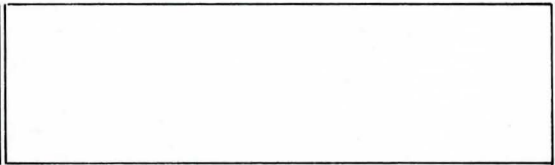
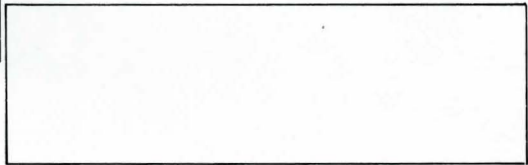
A typical Upper Mississippi River Tow consists of 15 barges and one towboat.



<p>Towboat 4,000-5,000 horsepower \$2,250,000 (cost to buy) 40 ft. wide, 140 ft. long</p>



<p>1500 tons capacity/barge \$195,000 (cost to buy) 35 ft. wide, 195 ft. long</p>



Speed 5-7 m.p.h.

